

CLAIMS

1. A method for driving an ink jet recording head which method applies a driving voltage to an electromechanical converter to deform the electromechanical converter to thereby change a pressure in the pressure generating chamber filled with ink, thus ejecting ink droplets through a nozzle in communication with the pressure generating chamber, the method being characterized in that:

a voltage waveform of said driving voltage comprises:

at least a first voltage changing process for applying a voltage in a direction that increases a volume of said pressure generating chamber;

a second voltage changing process for then applying a voltage in a direction that reduces the volume of said pressure generating chamber; and

a third voltage changing process for applying a voltage in a direction that increases the volume of said pressure generating chamber again, and

voltage changing times t_2 and t_3 during the second and third voltage changing processes are set to have such lengths as shown below, relative to a resonance frequency T_c of a pressure wave generated in the pressure generating chamber:

$$0 < t_2 < T_c/2$$

$$0 < t_3 < T_c/2.$$

2. The method for driving an ink jet recording head according to claim 1, characterized in that a start time of said third voltage changing process is about the same as an end time of said second voltage changing process.

3. The method for driving an ink jet recording head according to claim 1 or 2, characterized in that the voltage waveform of said driving voltage includes a fourth voltage changing process for applying a voltage in

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a direction that reduces the voltage of said pressure generating chamber, after said first voltage changing process, said second voltage changing process, and said third voltage changing process.

4. The method for driving an ink jet recording head according to claim 3, characterized in that a voltage changing time t_4 during said fourth voltage changing process is set as follows relative to the resonance frequency T_c of the pressure wave generated in said pressure generating chamber:

$$0 < t_4 < T_c/2$$

5. The method for driving an ink jet recording head according to claim 3 or 4, characterized in that a time interval between a start time of said second voltage changing process and a start time of said fourth voltage changing process is set substantially half the length of the resonance frequency T_c of the pressure wave generated in said pressure generating chamber.

6. The method for driving an ink jet recording head according to any of claims 1 to 5, characterized in that said electromechanical converter is a piezoelectric actuator.

7. The method for driving an ink jet recording head according to any of claims 1 to 5, characterized in that an ink jet recording head with the nozzle of 20 to 40 μ m opening diameter is driven to eject ink droplets of 5 to 25 μ m size.

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